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4 February 2015, Article number 7031656, Pages 277-280
5th International Conference on Computer and Communication Engineering, ICCCE 2014; Sunway Putra HotelKuala Lumpur; Malaysia; 23 September 2014 through 24 September 2014; Category numberE5413; Code 110844

Hardware implementation of ANFIS controller for gas-particle separations in wet scrubber system (Conference Paper)

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Abstract

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Wet scrubber system has been used for the control of gas and particulate matter (PM) emissions from production industries. Due to non-linear characteristics, wet scrubbers are limited to the control of PM that is less than 5μm. In this study, an intelligent control technique based on Adaptive Neuro-Fuzzy Inference System (ANFIS) has been designed using MATLAB software. The ANFIS Controller has the advantage of solving non-linearities in the proposed wet scrubber system by manipulating the scrubbing liquid droplet size for the effective control of particulate matter that is less than 5μm. From the simulation results, the controller was able to set PM concentration below the set-point and provides smooth control response within short settling time. Hardware implementation of the ANFIS controller was performed using prototype wet scrubber system by considering Arduino Duemilanove microcontroller and MATLAB interface. The results show that the intelligent controller has achieved the desired objectives of controlling the PM concentration effectively by setting the value below the set point (20μg/m^3) which is the allowable PM concentration standard recommended by World Health Organization. © 2014 IEEE.

Author keywords

ANFIS controller gas-particle separations hardware implementation wet scrubber system

Indexed keywords

Engineering controlled terms: Computer hardware Controllers Fuzzy inference Fuzzy systems Gas emissions Hardware Intelligent agents Intelligent control MATLAB Particle separators Scrubbers

Adaptive neuro-fuzzy inference system

Gas-particle separation

Hardware implementations

Intelligent controllers

Nonlinear characteristics

Particulate matter emissions

Wet scrubbers

World Health Organization

Engineering main heading: Adaptive control systems

ISBN: 978-147997635-5
Source Type: Conference Proceeding
Original language: English

DOI: 10.1109/ICCCE.2014.85
Document Type: Conference Paper
Volume Editors: Gunawan T.S.
Sponsors: Felda Wellness Corporation,Malaysia Convention and Exhibition Bureau (MyCEB),Malaysian Industry-Government Group for High Technology,University Putra Malaysia,Yayasan Kesejanteran Bandar
Publisher: Institute of Electrical and Electronics Engineers Inc.

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